

ECE 111: Intro to ECE

Week #4: Math 129

1) Express the following equations in matrix form

$$-a + 7b + 5c + 3d = -10$$

$$15a - 12b + 11c - 7d = -8$$

$$15a + 8b = 29$$

$$17b - 11d = 15$$

2) Express the following equations in matrix form

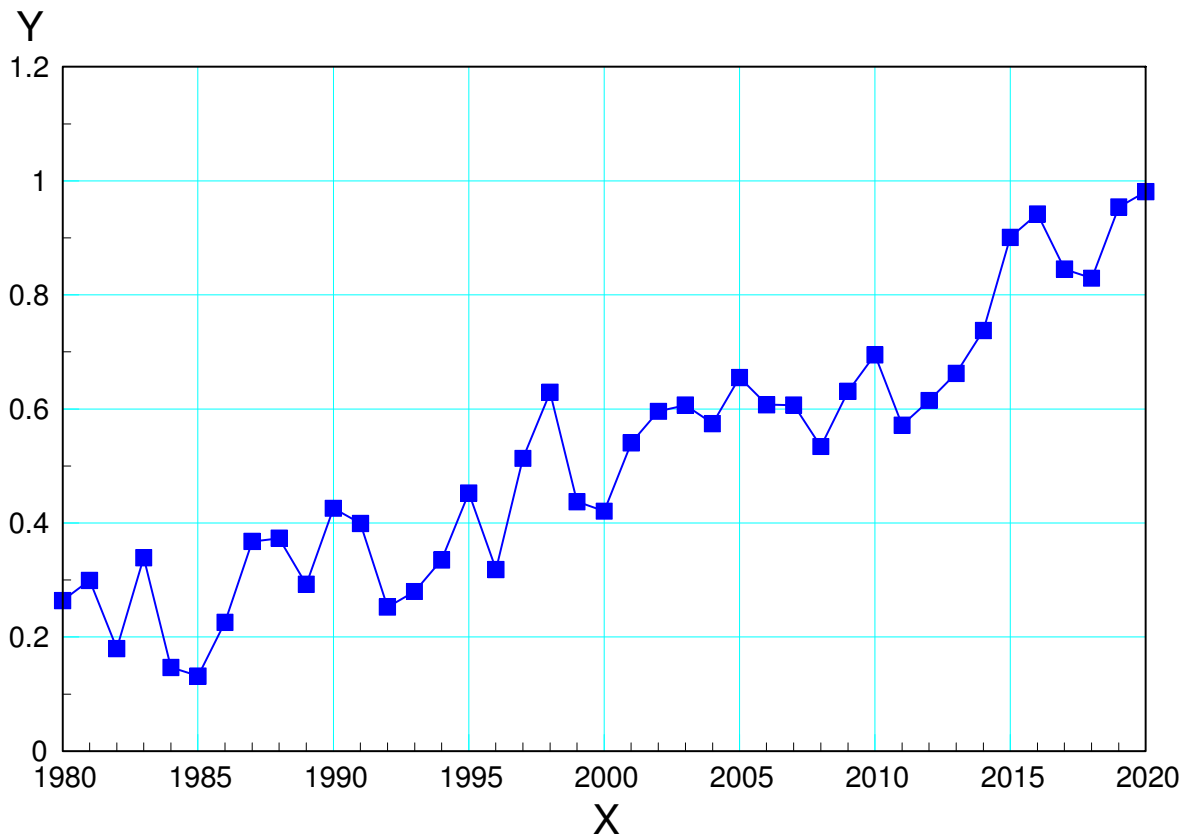
$$4a - b = 12$$

$$-2b + 12c = 11$$

$$c + 8d = 0$$

$$17a + 4b + 7c + d = 16$$

3) Find the relationship between X and Y: $Y = aX + b$



ECE 111: Handout #4

Week #4: Math 129 Linear Algebra

1) Express the following equations in matrix form

$$-a + 7b + 5c + 3d = -10$$

$$15a - 12b + 11c - 7d = -8$$

$$15a + 8b = 29$$

$$17b - 11d = 15$$

In matrix form

$$\begin{bmatrix} -1 & 7 & 5 & 3 \\ 15 & -12 & 11 & -7 \\ 15 & 8 & 0 & 0 \\ 0 & 17 & 0 & -11 \end{bmatrix} \begin{bmatrix} a \\ b \\ c \\ d \end{bmatrix} = \begin{bmatrix} -10 \\ -8 \\ 29 \\ 15 \end{bmatrix}$$

2) Express the following equations in matrix form

$$4a - b = 12$$

$$-2b + 12c = 11$$

$$c + 8d = 0$$

$$17a + 4b + 7c + d = 16$$

in matrix form

$$\begin{bmatrix} 4 & -1 & 0 & 0 \\ 0 & -2 & 12 & 0 \\ 0 & 0 & 1 & 8 \\ 17 & 4 & 7 & 1 \end{bmatrix} \begin{bmatrix} a \\ b \\ c \\ d \end{bmatrix} = \begin{bmatrix} 12 \\ 11 \\ 0 \\ 16 \end{bmatrix}$$

3) Find the relationship between X and Y

Slope = change in Y / change in X

$$a = \left(\frac{0.9 - 0.15}{2020 - 1980} \right) = 0.019$$

intercept: Plug in a point

$$y = ax + b$$

$$0.9 = (0.019)(2020) + b$$

$$b = -36.975$$

so

$$y \approx 0.019x - 36.975$$

